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TECHNICAL MEMORANDUM

TO: **Michael Gleason, Will Ernst (Boeing)** **Date: October 30, 2008**

FR: **Michael Lumpkin, Scott Matthees (Golder)** **Job No.: 013-1646.008.400**

RE: **Completion of Building 2-10, New Exterior Foundation Excavation**

1. Introduction

Boeing has completed excavation activities and the installation of a new equipment foundation on the east side of Building 2-10. Construction work was completed between July 7 and 10, 2008. The new foundation measures approximately 34.5 feet long (north-south) by 14 feet wide (east-west) and is located on the east exterior of Building 2-10, approximately 335 feet southeast of the northeast corner of that building between Column Lines 30 and 31 (Figure 1).

Excavation for the new foundation required the removal of existing concrete pavement, and the re-shaping of the underlying base rock material, particularly around the foundation perimeter. No base rock was removed from the footprint of the excavation, and the underlying fill material was not exposed or disturbed. The new foundation consists of an 8-inch thick, reinforced concrete slab cast on a 6-inch thick layer of compacted granular base material, and includes a two foot wide thickened concrete edge (18 inches thick) around its perimeter. The new slab protrudes approximately 4-inches above the surrounding concrete pavement.

The area of the new machine foundation is located within the western edge of RCRA Unit OA5 - Fueling Station, which surrounds an active fuel island located approximately 80 feet to the east of the new foundation. Construction of the new foundation was limited to the western edge of the RCRA Unit (Figure 2).

Construction support activities included environmental monitoring of the concrete removal, excavation, and subgrade preparation for the new foundation. The monitoring activities were conducted in accordance with the Technical Memorandum titled *"Building 2-10, New Machine Foundation Excavation"* dated July 1, 2008 (Golder, 2008).

This memorandum presents descriptions of the construction monitoring activities; a review of the evaluation of the historical environmental data associated with, and in proximity to the work area; and, observations noted during construction.

2. Concrete Removal and Excavation

The existing concrete pavement was saw-cut around the perimeter of the new foundation footprint and then cross-cut into smaller blocks on the interior of the footprint to facilitate removal. The existing concrete pavement averaged 10-inches thick and the underlying crushed rock base averaged more than 8-inches thick. Approximately 15 cubic yards of concrete were removed and managed for appropriate disposition on July 7, 2007. No signs of contamination were observed during the removal of the concrete.

The base rock underlying the existing concrete consisted of uniform brown, 1-inch minus crushed rock. Approximately 6 to 8-inches of the existing base rock were removed from a 2-foot wide strip just inside the perimeter of the excavation and placed in the center of the excavation on July 10, 2008. The base rock was shaped in this manner to accommodate a 2-foot wide by 18-inch thick wedge-shaped edge in the perimeter of the new foundation. No signs of contamination were observed when the base rock material was disturbed. Additional crushed rock base was imported and placed in the center of the excavation to shape the invert of the interior of the new slab. No existing sub-base rock was removed and no underlying fill material was exposed or disturbed. Due to the shallow depth of the excavation, groundwater was not encountered as the water table in the area is approximately 9 feet to 12 feet bgs in the area.

3. Preconstruction Analytical Data Review

Historical analytical data were reviewed for soil samples from all borings located within an approximate 50-foot radius of the center of the new foundation. Four historical borings were located within that radius (Figure 2). Details of the historical data review were presented in the Technical Memorandum titled *"Building 2-10, New Machine Foundation Excavation"* (Golder, 2008), and are recapped below.

Historical Soil Samples

The review of historical soil samples indicated that analytical soils data from two borings included samples within 10 feet of the ground surface. Since the planned excavation was less than 2 feet below the ground surface (bgs), the analytical data review was limited to samples collected from a depth of less than 10 feet bgs. Soil analytical data from the historical borings were reviewed for potential constituents of concern (COCs). Identification of COCs was based on comparison with the 2004 Soil Screening Levels (Screening Levels). Risk of exposure respective of human health and the environment was evaluated using proposed Target Media Clean-up Levels (TMCLs) currently being reviewed by EPA.

The analytical data for soils included only NWTPH-Gx and indicated that no COC concentrations exceeded their respective Screening Levels or their proposed TMCLs. However, the soil analytical data indicated that the reporting limits for non-detected concentrations of benzene were higher than the Screening Level but much lower than the TMCL for Benzene.

Based upon the shallow excavation depth and the evaluation of the soil analytical data discussed above, no preconstruction soil sampling was planned; and based on the results of construction monitoring, no construction soil sampling was performed.

Historical Groundwater Samples

Although groundwater was not expected to be encountered in the excavation, historical groundwater analytical data were reviewed to provide an indication of potential COCs in the vicinity of the work area. Fourteen historical groundwater samples were collected from three borings at depths ranging to 23 feet bgs. The samples were analyzed for volatile organic compounds (VOCs), petroleum hydrocarbons, dissolved metals, and total metals. Historical groundwater analytical data from the borings were reviewed for potential COCs, which were based on comparison with the 2004 Groundwater Screening Levels (GW Screening Levels) and the proposed groundwater TMCLs (GW TMCLs) currently being reviewed by EPA.

Benzene was detected in groundwater in two borings at a depth greater than 10 feet bgs in concentrations that exceeded the respective screening level and the proposed TMCL for benzene.

Barium and Zinc were detected in groundwater at a depth greater than 10 feet their respective proposed TMCLs. Copper, Lead, Nickel, and Thallium were detected at a depth greater than 10 feet in a concentration exceeding both their respective screening levels and proposed TMCLs.

The analytical data also indicated that the reporting limits for several non-detected concentrations of VOCs and total metals in three borings exceeded the respective screening levels and/or the proposed TMCLs for those constituents. Groundwater was not expected and none was encountered during excavation.

4. Construction Support Activities

A preconstruction review of historical analytical data was completed for the soil and groundwater data from borings and sampling locations in the vicinity of the work. The historical data adequately characterized the soil in the work area, and no preconstruction or construction sampling was therefore planned, unless warranted by the results of field monitoring during construction. Field monitoring of all excavated materials was conducted during construction in accordance with the procedures outlined in the *"Field Activities"* section of the Technical Memorandum *"Building 2-10, New Machine Foundation Excavation "* (Golder, July 2008). The field monitoring included visual observations of the pavements and base rock materials for odors, color changes or staining; checking for sheens; and using a photo-ionization detector (PID) to monitor the materials for volatile organic carbons (VOCs). No signs of contamination were observed or detected, and no additional sampling was therefore conducted.

5. Summary

Demolition and excavation activities were initiated on July 7 and completed on July 10, 2008 to accommodate the casting of the new foundation slab. A preconstruction review of historical analytical data was completed for the soil and groundwater data from borings and sampling locations in the vicinity of the work. The historical data adequately characterized the soil and groundwater in the work area, and no preconstruction or construction sampling was therefore planned. Field monitoring of all excavated materials was conducted during construction in accordance with the Technical Memorandum (Golder, July 2008). No signs of contamination were observed or detected during construction, and no soil or groundwater sampling was therefore conducted. Excavated materials were limited to existing concrete and base rock materials. The removed concrete was properly managed for disposition, and no base rock or soil materials were removed from the excavation.

6. References

Golder Associates Inc. *Technical Memorandum, Building 2-10, New Machine Foundation Excavation*. July, 2008.

cc: K. Angelos (Golder)
File: 013-1646.008.400

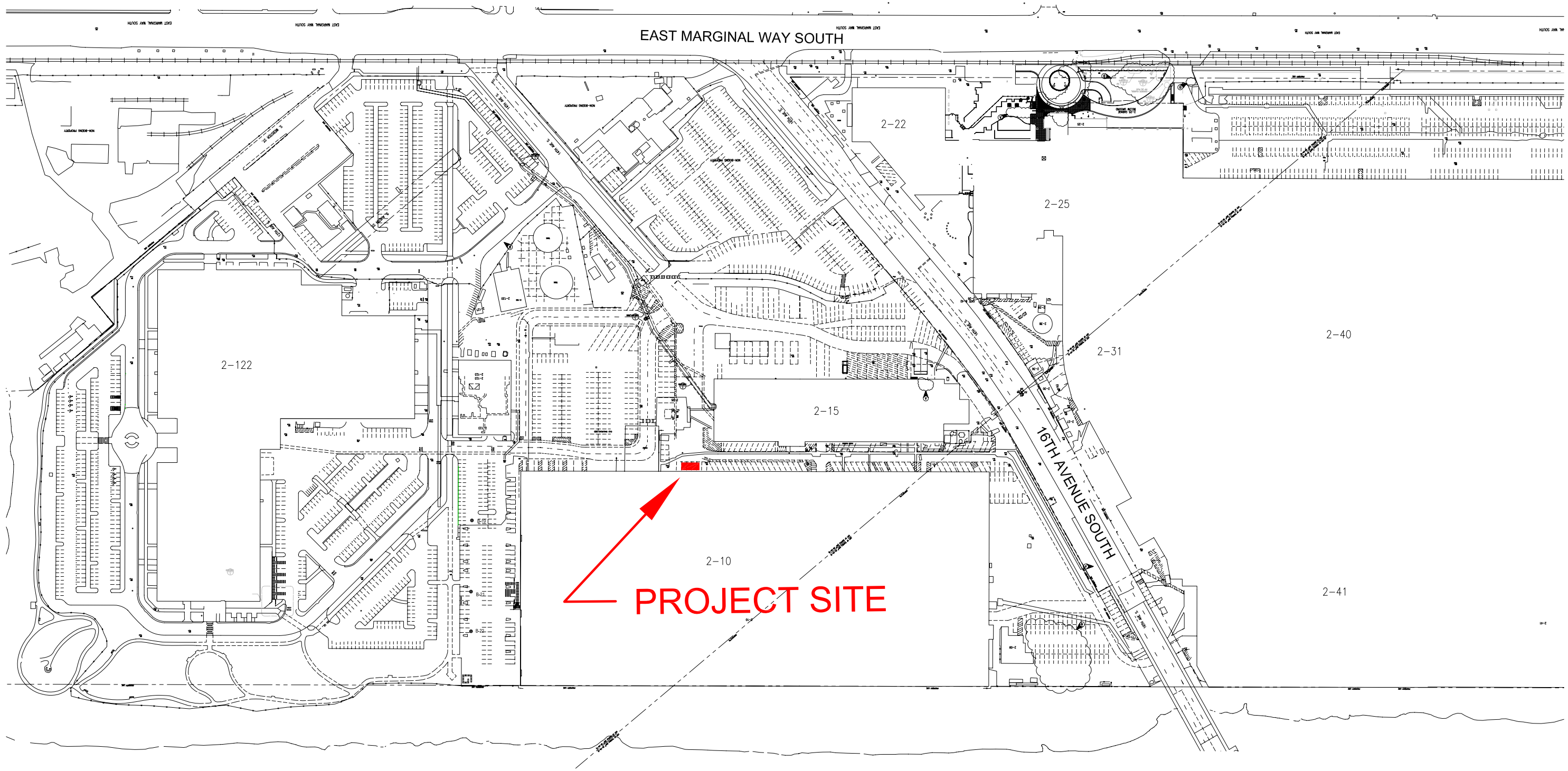

FIGURE **1**

LOCATION AND VICINITY

BLDG 2-10 NEW FOUNDATION EXCAVATION

BOEING/PLANT 2 CMS/WA

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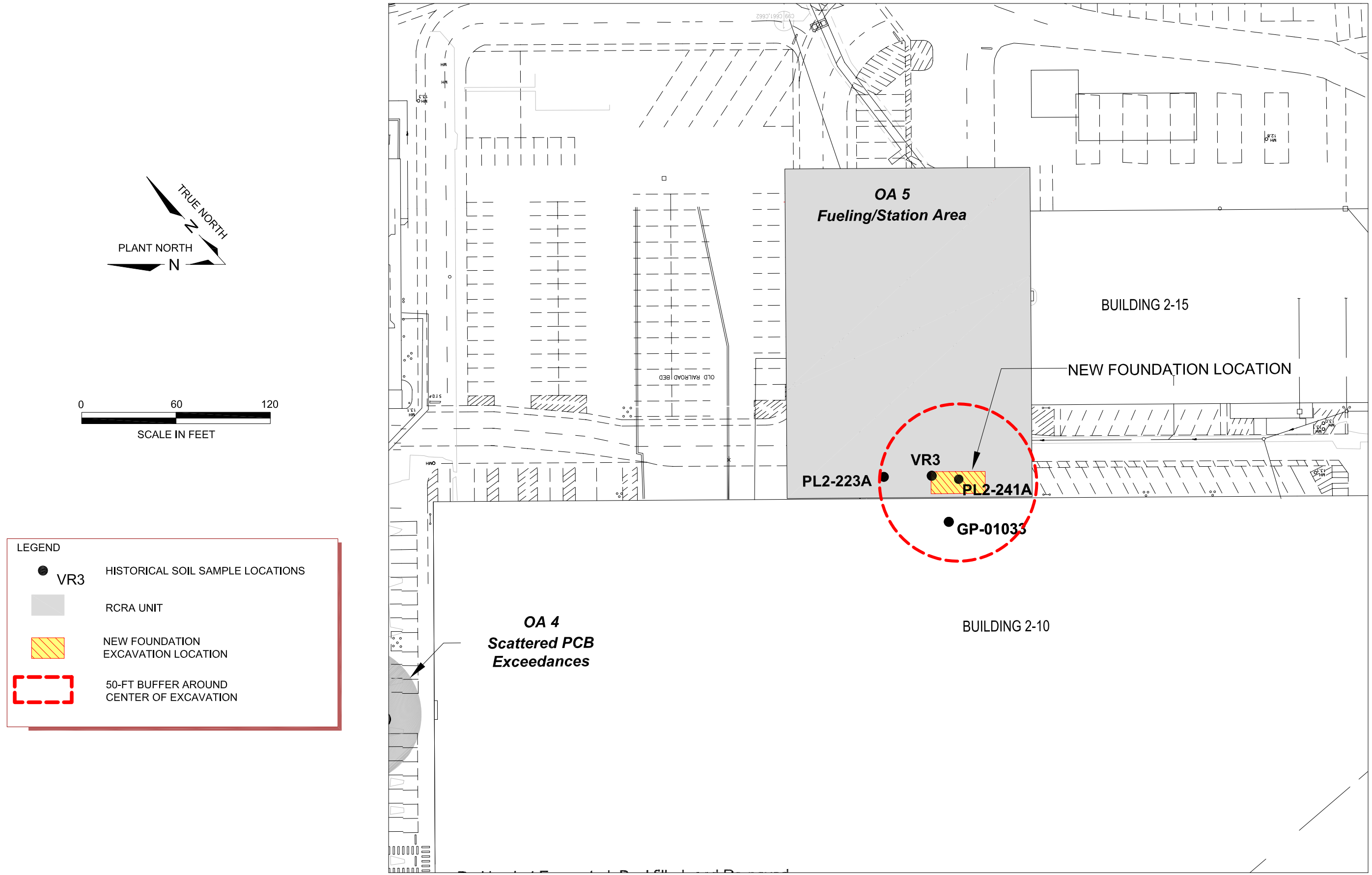

FIGURE **2**

BUILDING 2-10, NEW FOUNDATION EXCAVATION

BOEING/PLANT 2

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